

Determination of optimum levels of nitrogen, phosphorus and potassium of oil palm seedlings in solution culture

ABSTRACT

Balanced nutrient elements in fertilizer play a critical role in oil palm seedling successful growth and development, and at the same time reduces of fertilizer losses in the environment. This study examines the effect of different levels of N, P₂O₅ and K₂O for oil palm seedlings in solution culture on growth traits, nutrient uptake in plant tissues and biomass accumulation under nursery conditions. Five concentration levels of N (50, 100, 300, 600 and 900 mg L⁻¹), P₂O₅ and K₂O (15, 30, 60, 90 and 120 mg L⁻¹) were used in a completely randomized design (CRD) with five replications for each. Parameters measured during the growing period include - plant height, leaf number/plant, stem diameter, SPAD chlorophyll value, and at harvest total leaf area, root dry weight, shoot dry weight and total dry weight. Different levels of N, P₂O₅ and K₂O showed significant effects on all the parameters studied. The highest values for diameter, plant height, leaf number/plant, total leaf area, root dry weight, shoot dry weight and total dry biomass were obtained using 100, 90 and 300 mg/L levels of N, P₂O₅ and K₂O, respectively. Most of the growth parameters, declined with lower levels of N, P₂O₅ and K₂O. The results of this study provide a new knowledge to produce oil palm plant with better nutrient management at the nursery under solution culture.

Keyword: Growth parameters; Solution culture; Oil palm; Optimum level